

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A data segmentation method in a telecommunications system, comprising:

segmenting larger data units of a higher layer into smaller protocol data units of a lower layer so that each lower layer protocol data unit includes one or more data segments each containing data from a different one of the upper layer data units;

providing the lower layer protocol data units containing two or more data segments, with segmentation length information which otherwise indicates length of the data segments;

indicating with predetermined values of the segmentation length information, special information about the higher level protocol data units instead of the length of the segments at least in the lower layer protocol data units containing two or more data segments;

transmitting the lower level protocol data units to a receiving end; and

assembling the segmented higher level data unit at the receiving end by means of the segmentation length information.

2. (Previously Presented) The method of claim 1, wherein the special information includes indication whether the higher layer data unit ends in a current data segment or continues to a next lower level protocol data unit.

3. (Previously Presented) The method of claim 1, further comprising indicating with a predetermined value of the segmentation length information that the rest of the lower level protocol data unit contains padding until a next segmentation length information or a next lower level protocol data unit contains padding.

4. (Previously Presented) The method of claim 1, further comprising indicating with the segmentation length information an exact point in the end of the lower layer protocol data unit that the higher layer data unit ends.

5. (Previously Presented) The method of claim 1, further comprising indicating with a predetermined value of the segmentation length information that the higher layer data unit carried in a current data segment continues to a next lower level protocol data unit.

6. (Currently Amended) ~~The method of claim 1, further comprising~~ A data segmentation method in a telecommunication system, comprising:

segmenting larger data unites of a higher layer into smaller protocol data units of a lower layer so that each lower layer protocol data unit includes one or more data segments each containing data from a different one of the upper layer data units;

providing the lower layer protocol data units containing two or more data segments, with segmentation length information which otherwise indicates length of the data segments;

indicating with predetermined values of the segmentation length information special information about the higher level protocol data unit instead of the length of the segments;

transmitting the lower level protocol data units to a receiving end;

assembling the segmented higher level data unit at the receiving end by means of the segmentation length information; and

providing no segmentation information in a lower layer protocol data unit which contains data only from a single one of the higher layer data units and no padding.

7. (Previously Presented) The method of claim 1, further comprising providing segmentation information in a lower layer protocol data unit which contains data only from a single one of the higher layer data units and padding.

8. (Currently Amended) ~~The method of claim 1, further comprising~~ A data segmentation method in a telecommunications system, comprising:

segmenting larger data units of a higher layer into smaller protocol data units of a lower layer so that each lower layer protocol data unit includes one or more data segments each containing data from a different one of the upper layer units;

providing the lower layer protocol data units containing two or more data segments, with segmentation length information which otherwise indicates length of the data segments;

indicating with predetermined values of the segmentation length information special information about the higher level protocol data unit instead of the length of the segments;

transmitting the lower level protocol data units to a receiving end;

assembling the segmented higher level data unit at the receiving end by means of the segmentation length information;

providing each lower level protocol data unit with two or more payload units of a predetermined length, the payload units being a smallest unit in a retransmission protocol employed;

carrying the segmented higher layer data units in the payload units;

providing a segmentation indicator field in a beginning of one or more of the payload units in the lower level protocol data unit, if required; and

indicating in a header of the lower layer protocol data unit which one or ones, if any, of the payload units contain the segmentation length information.

9. (Previously Presented) The method of claim 8, further comprising providing a segmentation indicator field in a beginning of a first one of the payload units for indicating segmentation information for all segments in the lower level protocol data unit, if required.

10. (Currently Amended) A telecommunications system, comprising
an upper protocol layer including upper layer data units;
a lower protocol layer including protocol data units having a payload size smaller than the upper layer data units;

means segmenting the upper layer data units for insertion into smaller protocol data units of a lower layer so that each lower layer protocol data unit includes one or more data segments, each containing data from a different one of the upper layer data units;

means for inserting segmentation length information which indicates length of the data segments at least in the lower layer protocol data units containing two or more data segments;

means for providing a predetermined value in the segmentation length information to a receiver, the predetermined value including special information about the higher level data units instead of the length of the data segments at least in the lower layer protocol data units containing two or more data segments; and

means for assembling the segmented higher level data units from received lower layer protocol data units at the receiver by means of the segmentation length information in the protocol data units.

11. (Previously Presented) The system of claim 10, further comprising a predetermined value of the segmentation length information indicating to the receiver that a rest of the lower level protocol data unit contains no padding until a next segmentation length information or a next lower level protocol data unit contains padding.

12. (Previously Presented) The system of claim 10, further comprising a predetermined value of the segmentation length information indicating to the receiver that the higher layer data unit carried in the current data segment continues to a next lower level protocol data unit.

13. (Previously Presented) The system of claim 10, wherein the segmentation length information points exactly to an end of the lower layer protocol data unit where the higher layer data unit ends.

14. (Currently Amended) ~~The system of claim 10, further comprising:~~ A telecommunications system, comprising:

an upper protocol layer including upper layer data units;

a lower protocol layer including protocol data units having a payload size smaller than the upper layer data units;

means segmenting the upper layer data units for insertion into smaller protocol data units of a lower layer so that each lower layer protocol data unit includes one or more data segments each containing data from a different one of the upper layer data units;

means for inserting segmentation length information which indicates length of the data segments at least in the lower layer protocol data units containing two or more data segments;

means for providing a predetermined value in the segmentation length information to a receiver, the predetermined value including special information about the higher level data units instead of the length of the data segments;

means for assembling the segmented higher level data units from received lower layer protocol data units at the receiver by means of the segmentation length information in the protocol data units;

two or more payload units of a predetermined length in each lower level protocol data unit, with two or more payload units of a predetermined length for carrying the segmented

higher layer data units, the payload unit being a smallest unit in a retransmission protocol employed;

a segmentation indicator field in a beginning of one or more of the payload units in the lower level protocol data unit, if required; and

at least one indicator in a header of the lower layer protocol data unit for indicating which one or ones, if any, of the payload units contain the segmentation length information.

15. (New) A data segmentation method in a telecommunication system, comprising:

segmenting larger first data units of a higher protocol layer into data segments that can be accommodated by smaller second data units of a lower protocol layer, each second data unit comprising one or more data segments, each data segment containing data from a different one of the first data units;

providing the second data units with segmentation length information when the second data unit contains two or more data segments;

indicating with predetermined values of the segmentation length information special information about the first data units, values of said segmentation length information other than said predetermined values indicating the length of the data segments;

transmitting the second data units to a receiving end; and

assembling the first data units from the received second data units at the receiving end by means of the segmentation length information.

16. (New) A telecommunications system,
an upper protocol layer including first data units;
a lower protocol layer including second data unit having a payload size smaller than said first data units;

means segmenting said first data units into data segments that can be accommodated by the second data units for insertion into the second data units each second data unit comprising one or more data segments, each data segment containing data from a different one of the first data units;

means for inserting a segmentation length information in the second data units when the second data unit contains data from two or more of the first data units;

means for giving a predetermined value in the segmentation length information in order to provide a receiver with special information about the first data units, values of said segmentation length information other than said predetermined values indicating the length of the data segments; and

means for assembling the segmented first data unit from received second data units at the receiver by means of the segmentation length information in said second data units.

17. (New) A mobile station, comprising
- the mobile station being configured to support an upper protocol layer including first data units;
 - the mobile station being configured to support a lower protocol layer including second data unit having a payload size smaller than said first data units;
 - the mobile station being configured to segment said first data units into data segments that can be accommodated by the second data units for insertion into the second data units, each second data unit including one or more data segments;
 - the mobile station being configured to insert a segmentation length information in the second data unit when the second data unit contains data from two or more of the first data units;
 - the mobile station being configured to set a predetermined value for the segmentation length information in order to provide a receiver with special information about the first data units, values of said segmentation length information other than said predetermined values indicating the length of the data segments;
 - the mobile station being configured to assemble the segmented first data unit from received second data units at the receiver by means of the segmentation length information included in said second data units.

18. (New) A mobile station, comprising
- the mobile station being configured to support an upper protocol layer including first data units;
 - the mobile station being configured to support a lower protocol layer including second data unit having a payload size smaller than said first data units;

the mobile station being configured to segment said first data units into data segments that can be accommodated by the second data units for insertion into the second data units, each second data unit including one or more data segments;

the mobile station being configured to insert a segmentation length information in the second data unit when the second data unit contains data from two or more of the first data units;

the mobile station being configured to set a predetermined value for the segmentation length information in order to provide a receiver with special information about the first data units, values of said segmentation length information other than said predetermined values indicating the length of the data segments;

the mobile station being configured to assemble the segmented first data unit from received second data units at the receiver by means of the segmentation length information included in said second data units;

two or more payload units of a predetermined length in each second data unit, with two or more payload units of a predetermined length for carrying the segmented first data units, the payload unit being a smallest unit in a retransmission protocol employed;

a segmentation indicator field in a beginning of one or more of the payload units in the second data unit, if required; and

at least one indicator in a header of the second data unit for indicating which one or ones, if any, of the payload units contain the segmentation length information.

19. (New) A network element, comprising

the network element being configured to support an upper protocol layer including first data units;

the network element being configured to support a lower protocol layer including second data unit having a payload size smaller than said first data units;

the network element being configured to segment said first data units into data segments that can be accommodated by the second data units for insertion into the second data units, each second data unit including one or more data segments;

the network element being configured to insert a segmentation length information in the second data unit when the second data unit contains data from two or more of the first data units;

the network element being configured to set a predetermined value for the segmentation length information in order to provide a receiver with special information about the first data units at least in the lower layer protocol data units containing two or more data segments, values of said segmentation length information other than said predetermined values indicating the length of the data segments;

the network element being configured to assemble the segmented first data unit from received second data units at the receiver by means of the segmentation length information including in said second data units.

20. (New) A network element, comprising
the network element being configured to support an upper protocol layer including first data units;

the network element being configured to support a lower protocol layer including second data unit having a payload size smaller than said first data units;

the network element being configured to segment said first data units into data segments that can be accommodated by the second data units for insertion into the second data units, each second data unit including one or more data segments;

the network element being configured to insert a segmentation length information in the second data unit when the second data unit contains data from two or more of the first data units;

the network element being configured to set a predetermined value for the segmentation length information in order to provide a receiver with special information about the first data units, values of said segmentation length information other than said predetermined values indicating the length of the data segments;

the network element being configured to assemble the segmented first data unit from received second data units at the receiver by means of the segmentation length information included in said second data units;

two or more payload units of a predetermined length in each second data unit, with two or more payload units of a predetermined length for carrying the segmented first data units, the payload unit being a smaller unit in a retransmission protocol employed;

a segmentation indicator field in a beginning of one or more of the payload units in the second data unit, if required; and

at least one indicator in a header of the second data unit for indicating which one or ones, if any, of the payload units contain the segmentation length information.